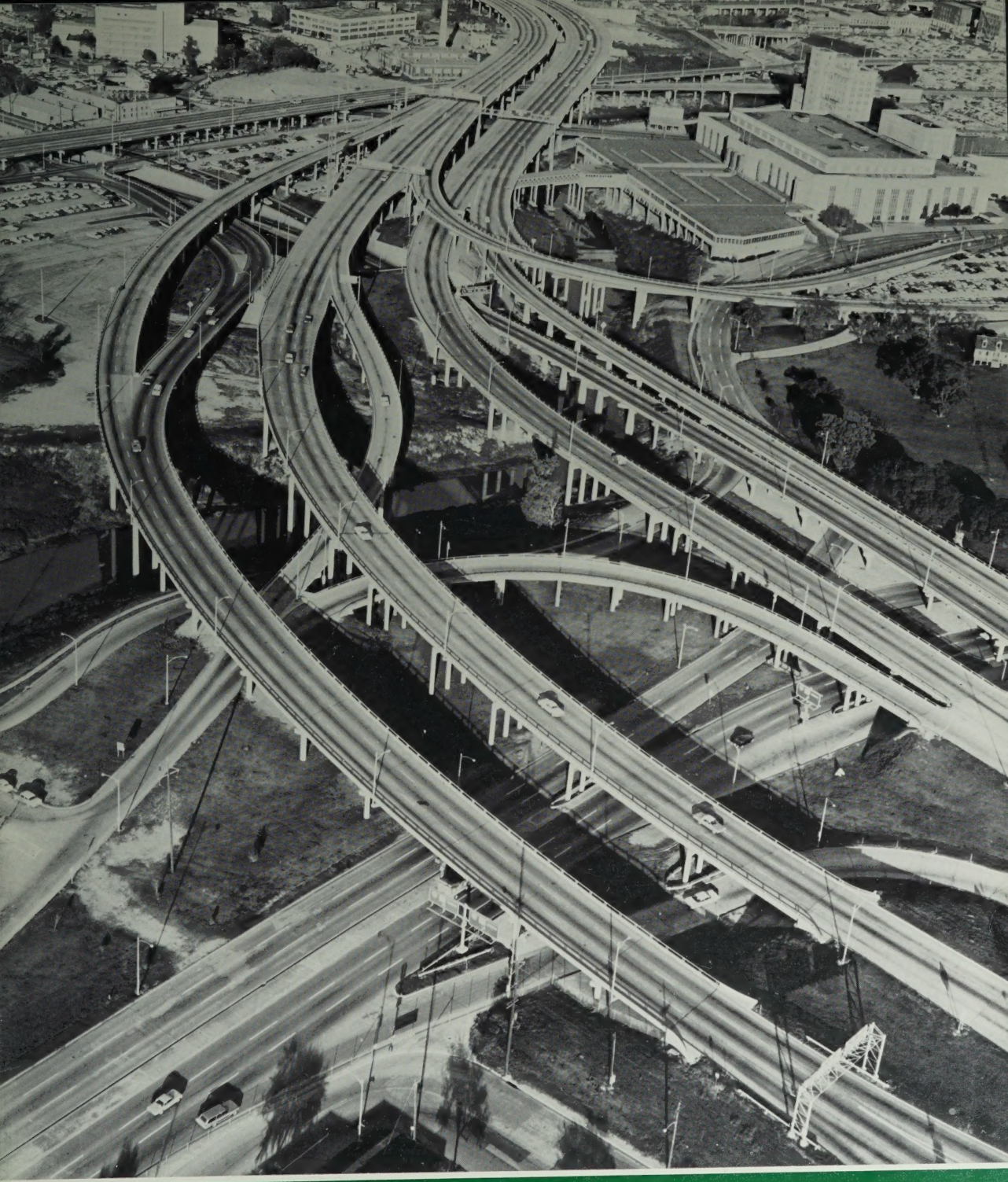

Texas Highways

June 1965

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About Our Cover

The massive "Spaghetti Bowl" in downtown Houston feeds traffic onto city streets in multilevel profusion. This is Interstate 45, running north and south through the city, and it will eventually allow motorists to travel nonstop from Dallas to Galveston. Jack Lewis took the picture.

Inside Front Cover

Wayne Jarnagin, Materials Analyst II, tests a sample of asphalt to find the proportion of base asphalt to solvent. The solvent, similar to kerosene or gasoline, is added to base stock of oil asphalt to make it more fluid and thereby require less heat for application. This is called "cutting back the asphalt." The solvent evaporates after the material is placed.

No Substitute for Safety

This is one of the busiest seasons of the year for the Texas Highway Department. Not only is construction at peak levels, but emphasis is on maintenance to take advantage of more favorable weather conditions.

Generally, when we think of highway safety, concern is with design — to make driving less hazardous and more pleasant. But Highway Department employes need to be conscious of highway safety as it relates to their jobs.

And it follows that the more activity in both construction and maintenance the greater the danger of crippling or fatal injury in the field or shops.

Lost-time accidents generally are painful—and costly. They not only reduce departmental efficiency, but they can be economically disastrous for the employe.

Compensation for lost time falls far short of comparable earnings, limited to 60 per cent of average income and a maximum of $35 per week. The State retirement system lump sum payment equivalent to a year's income for job-attendant fatality may ease—but only temporarily—the financial loss to an employe's family.

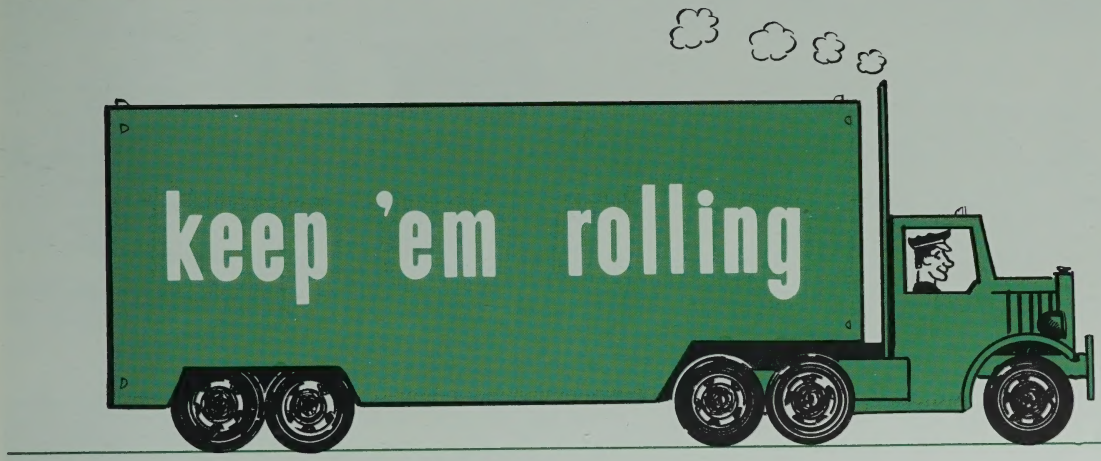
But the void left in the family circle cannot be filled by a check of any amount. Even though social security benefits provide some measure of financial relief to the widow and children, the love and guidance of a living father is irreplaceable.

There is nothing complicated about the exercise of normal safety precautions while at work. Just remember a few simple rules—and follow them!

The most important consideration is to be alert. Concentrate on the job at hand, and the hazards involved. If handling tools, use the appropriate protective devices. If working on the highway or right of way, be constantly alert to moving traffic.

Help your work group compile an accident-free record during this busy season . . . and all the year.

Portable Scale Designed to



THE FAMILIAR SCENE of trucks pulling off the highway to be weighed may soon join the narrow bridge and the sharp curve as hazards that no longer threaten motorists along Texas highways.

Research engineers at the University of Texas have developed a portable dynamic scale for weighing moving trucks on Texas highways. The new scale will show design engineers the actual dynamic forces acting on the roads and bridges instead of the static loads that are now being obtained by stopping the trucks on the highways.

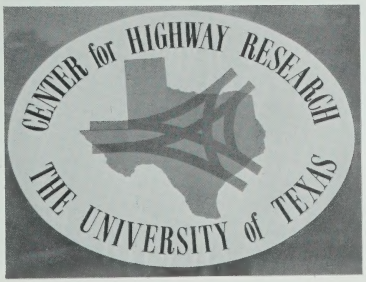
Dr. Clyde Lee, associate professor of civil engineering at the University, invented the portable scale and is project supervisor in the cooperative research program with the Highway Department and the Bureau of Public Roads.

"This scale will allow us to measure dynamic loads, something we have been unable to do in the past," says Mc Shelby, research engineer for the Department's Highway Design Division. "This will mean we can design for actual conditions."

George Carver, director of Planning Survey Division, which is responsible for gathering design data, said the portable scale will allow his division to broaden its coverage in the state. Carver is contact representative for the Highway Department on the research project. H. M. Bremer is representative for the Bureau of Public Roads.

Dr. Lee lists these advantages for the new scale:

- Actual dynamic loads can be measured for future design standards.
- The effects of cumbersome loads on pavements and bridges can be evaluated.
- Patterns of traffic flow can be measured to determine which lanes carry the various classes of traffic.
- Traffic flow will not be interrupted; thus the possibilities of accidents will be reduced.



- The scales possibly could be used for law enforcement, although the Highway Department is solely concerned with design data.
- The scales could even be used on construction projects to weigh the contractor's materials loads.

The new portable scale measures the speed of the vehicle, the weight on each wheel, and the spacing between axles.

Lee refers to the flat, 200-pound steel scales as transducers, devices which change the mechanical strains produced by wheel loads to electrical signals. Each transducer, 50 by 20 by 1½ inches thick, is built like a very thin triple-decker sandwich. Its thinness allows it to be laid in asphalt or concrete highways without materially affecting the road. Two transducers will be installed side by side in each lane of the highway under study so that each wheel of every passing vehicle will be measured.

"It takes only about two hours to remove the surface material from the road and install the transducers the first time," Lee claims. "After that it takes only minutes to install or remove them."

Outer layers of the triple-deck sandwich are composed of single steel plates,

A portable scale (far right) in front of a speeding bus furnishes dynamic load characteristics to highway engineers for more accurate design standards. A detector in front of the scale starts a recording machine in the nearby station wagon.

and the middle layer has three plates, each ¾-inch thick. Each of the three plates is supported at the corners by load cells, the devices that make the scales work.

Lee first designed the load cells and a pilot model of the scale in 1955 when he was working on a master's degree at Mississippi State. Highway engineers were not interested in the scale at that time, and he had to abandon the whole idea until 1963 when The University of Texas entered into a cooperative research program with the Highway Department.

The load cells are about one half-inch thick, two inches in diameter, with a large nipple on one side and a depression on the other. An etched foil strain gauge is attached with epoxy exactly in the center of the depression. The strain gauges are connected in a series so that no matter where the wheel load is applied —to all load cells or to just one—the resultant output signal is the same.

Ultimate load capacity of the cell is 10,000 pounds. The cells are made from ordinary tool steel and they can be mass produced if necessary. They are heat-treated to withstand heavy loads and wear and tear.

The thin sheet metal top plate makes the transducer insensitive to braking or acceleration forces. The transducer is sensitive only to loads acting normal to the pavement surface. Since the strain gauges are connected in series so that of the load cells, there had to be a way to cancel out changes caused by temperature variation. A special temperature-compensating circuit, composed of strain gauges bonded to discs of metal not subjected to external loads from trucks, is included in the scale. Signals from the temperature circuit counteract the effects of temperature on the weight-bearing load cells of the scale.

A final criterion in design of the scale was that it had to be rugged and waterproof—completely sealed. Each strain gauge in the transducer is waterproofed, and then the bottom plate of the sandwich is sealed with a gasket.

Graduate students, working under the supervision of Dr. Lee, tested the new scale in the field for 18 months before they were completely satisfied with the results. An oscilloscope first was used to read output signals, and the results were converted into load figures. Field work was carried out near the weighing station on I.H. 35 in the Belton-Temple area. Using a Walkie-Talkie, the research

team compared their results with those obtained at the static weighing station. Lee and Highway Department research engineers were pleased with the performance of the new scale.

Lee has written specifications for an instrument that will record all data in digital form so it can be fed into electronic data processing equipment, and the Department expects to purchase it within the year. The recorder will carry its own source of power for operation in remote areas.

Carver envisions mounting the recorder, along with transducers and other equipment necessary to set up operations, in a station wagon for ease in moving from one weighing location to another —no ten-ton trucks necessary.

Carver says shallow concrete linings to accommodate the scales will be set in the highways to be studied. When the scales are removed the holes will be filled with pre-mix asphalt on brown paper that will not adhere to the concrete. A permanent vehicle detector will be set flush with the pavement at a predetermined distance in front of the scale. From the interval between the time the truck wheels cross the detector to activate the recording device and the time it crosses the transducer, the speed of the vehicle can be determined.

Dr. Clyde Lee, University of Texas, describes the portable scale he designed to three interested Texas Highway Department engineers. From the left, they are T. S. Huff, chief engineer of Highway Design Division; Paul Tutt, supervising designing engineer, Highway Design Division; and George Carver, Planning Survey Engineer.

This present method of weighing static truck loads may soon go by the boards. It now takes a five-man crew about three and a half minutes to weigh only one side of a truck, measure the distance between axles, height and width of the truck, and to ask the driver his origin, destination, and kind of cargo.

A shallow hole about 20 by 50 inches is big enough to slip the portable scale into. Because of the thinness of the scale, asphalt and concrete highways are not materially affected by the digging. Once the hole is dug, it takes only minutes to install the scale.

"Only experience will tell us if we should leave the scales in place or move them around," Carver added. "Of course, a consideration of costs will enter into what we do."

And cost comparison of the portable scale versus the permanent weighing setup is an important factor. Permanent weighing stations can cost from $12,000 to $50,000, depending on the size of scales and the facilities used. In comparison, the portable scale transducers cost only a few hundred dollars each.

The Highway Department has 19 permanent weighing stations throughout the state. Turnout lanes 200 feet long had to be constructed beside the highway to accommodate trucks for weighing. It takes a five-man crew about three and a half minutes to complete the job for each truck: weigh the wheels (only on one side), measure the distance between axles and note the height and width of the truck, and ascertain from the driver his origin, destination and cargo.

This procedure often forces trucks to line up along the highway, and although the Department has never had a man injured, the weighing process does create a hazardous condition.

The portable scale will also be of benefit to the trucking industry. Drivers will not have to experience any delay whatsoever. This is in contrast to the present need for them to stop and advance as many as five times when a five-axle truck is being weighed. Engineering studies show that it costs as much as 10 cents in added operation expenses alone to stop some large vehicles.

The Highway Department plans to build its own scales for the time being. If law enforcement agencies or contractors see a need for the new scales, the demand for them may soar quickly to the point where commercial production of them is practicable.

Lee will run a final check this summer for over-all accuracy of his new weighing system. Highway Department engineers are optimistic, and this instrument's promise of success encourages them to envision other devices in the near future for measuring the forces of acceleration and braking to assure better highway design.

But that is another story. Right now design engineers are looking forward to next year when they can start getting dynamic load information from trucks as they keep rolling along Texas highways. ■

Pre-mix asphaltic concrete is placed on brown paper after the portable scale is removed. The paper keeps the pre-mix from adhering to the concrete shell.

A Plug for Clean Highways

Governor John Connally accepts from Pam Latham, travel counselor for the Texas Highway Department in the Capitol, the first of a quarter million litter bags given to the Department by the Galveston Chamber of Commerce and the Convention and Tourist Bureau. State Highway Engineer D. C. Greer seems to approve.

The Galveston Chamber of Commerce and the Galveston Convention and Tourist Bureau on April 23 presented to the Texas Highway Department 250,000 colorful litter bags to be distributed to motorists at the eight Tourist Information Centers located at points of entry on key Texas highways and in the Capitol rotunda.

The first bag was presented by Travel Counselor Pam Latham to Governor John Connally. He took advantage of the occasion to emphasize that $1.5 million of taxes levied on highway users is wasted each year to pick up litter thrown by careless motorists onto the right of way.

"This money could better be used to build more miles of new highways, and to protect the taxpayers' $4 billion investment in our existing system."

The bags were donated by the Galveston Chamber of Commerce to encourage litter control among out-of-state visitors. The bright orange, green, and white bags also bear a message of invitation to visit the Galveston Island Resort Area.

According to D. C. Greer, State Highway Engineer, approximately 12 million visitors come to Texas each year.

"These visitors represent an industry of more than one half billion dollars a year. We hope that Texans will become conscious of our litter problem and help us present a 'clean house' to our paying guests."

The Highway Department has distributed litter bags through the Tourist Information Centers for many years. However, this is the first time that any organization has donated such a large number of bags for free distribution.

Edwin D. Hunter, president of the Galveston Chamber of Commerce, was on hand for presentation of the first litter bag to the Governor. He remarked:

"Galveston merchants who are financing the purchase of these bags are very happy to try to help solve the state's litter problem. We are intensely interested in the tourist program. Only by presenting clean, inviting attractions can we hope to encourage out-of-state visitors to come to Texas again, and again and again."

John McCann, president of the Galveston Convention and Tourist Bureau, also traveled to Austin for the ceremony at the Capitol. ■

With the Greatest of Ease

I.H. 45 Soars Through

Albert E. Hall, Urban Administrative Engineer
Houston Urban Project

THE RECENTLY COMPLETED part of Interstate Highway 45, as it traverses the downtown area of the City of Houston, is something of a unique section of highway. Being three lanes in each direction, this roadway is elevated for nearly a mile as it crosses over 11 of the major north-south streets of the city.

Before construction of this highway, fear was expressed by some groups and individuals that such a roadway would form a psychological barrier to the growth of Houston south of this location. However, actual construction of the highway has eliminated such fears. Several office buildings in excess of 15 stories have been built south of the new highway since announcement of this project, and all evidence indicates this is but the beginning of growth on the south side of the highway. More specifically, two of these buildings have been built in the block adjacent to the highway.

Another fear expressed by some was that such a structure would be bulky and unsightly. The Houston Urban Office feels this objection has been overcome, also. In designing the structure every effort was made to streamline the facility.

A northwesterly view of the recently completed portion of I.H. 45 wending its elevated way through downtown Houston. Twenty feet above city streets, three lanes of traffic in each direction are separated by an eight-foot wide center median. Red jiggle bars designating parking lanes will be added.

the Air

In order to give the structure a neat and slender appearance, an inverted "T" shaped bent cap was devised. A majority of the caps were made of concrete, but where it was necessary to cross existing streets at an oblique angle, the caps were fabricated from steel beams with the same over-all dimensions as the concrete caps. Two coats of epoxy paint (6 mils), overlaid with two coats of vinyl (3 mils), were carefully selected to match the color of the concrete beams and were applied to the steel caps. Many persons, including engineers, have mistaken the steel caps for concrete. Inquiries from as far away as England have been received concerning the design of these caps, and a structure presently under construction in London, England, is designed similarly.

In streamlining this structure the designers did not lose sight of economics. The contract was let in December 1963, to Williams Brothers Construction Co., Inc., Thomas J. Evans Jr. and F. M. Reeves & Sons of Austin, Inc., for $2,899,719.73, or approximately $5.82 per square foot. This is one of the most inexpensive structures built in this area.

Not only does the structure serve a necessary and useful purpose, but the area beneath the structure is in great demand for parking. Houston and the Highway Department are presently preparing an agreement whereby the city will maintain and operate the area for public parking.

The project was designed and constructed under the supervision of A. C. Kyser, Engineer-Manager for the Houston Urban Project, and he was assisted on design matters by W. V. Ward, Urban Design Engineer, and by R. A. Vansickle, Urban Construction Engineer, on construction matters. Frank Geron was Resident Engineer. ■

Two multistory buildings have been erected in the block adjacent to the new elevated highway in Houston since its announcement. The large building on the right is an apartment building at the corner of Main and Gray, and the tall building in the background is the new St. Joseph's Professional Building.

Steel caps used at oblique angle crossings are coated with epoxy paint and vinyl to match the color of the concrete beams. Beneath the elevated structure there will be public parking facilities maintained by the City of Houston.

Greer Addresses Road Federation

State Highway Engineer Dewitt C. Greer spent a busman's holiday in South America last month, visiting highway officials in Brazil, Argentina, Chile, and Peru under the auspices of the International Road Federation. The focus of his trip was the International Road Federation South American Regional Meeting in Lima, Peru, held May 17 to 22. One of the themes of the Conference was "Roads and Road Transport for Economic Development," and Greer's address on the evolution of Texas highways stressed the importance of good roads to the economic development of Texas. Greer's speech to the Conference is a simple and forthright statement of his philosophy in guiding the affairs of the Texas Highway Department, and as such it is a valuable guide for all Highway Department employes. It appears here in abbreviated form.

TEXAS HIGHWAYS

To those of you who have visited the United States in recent years it may seem difficult to realize that my country was a vast, untamed wilderness no more than a century ago. Great expanses were as untouched by civilization as many primeval areas over which our airplanes flew to bring us to this meeting.

I am sure that many of you are familiar with this history of my country, of how the frontier was pushed back as men, seeking land and freedom, looked and moved ever westward. But did you know that no longer than 50 years ago this great nation still had no integrated system of highways?

Principal industrial development was on the East and West coasts of the United States half a century ago, and on the great inland ports and waterways. Except for the railroads connecting the two oceans the vast areas between were a veritable void, scantily populated with an economy based upon agriculture and almost wholly self-sustained.

It was not until 1916 that the first Federal highway program came into being. This program envisioned a network of all-weather roads to link the principal cities of the United States. It was, by today's standards, a simple program—some 40,000 miles of surfaced and improved roads. Today the United States has nearly 1.4 million miles of surfaced roads and streets, and nearly as many more miles of improved travelways (1.3 million miles).

Roads Create New Wealth

And coincident with the growth of this great highway system has been the economic and industrial growth of the United States. For good highways, as we now very well know, create wealth and economic stability. The great Thomas MacDonald, for many years chief of the United States Bureau of Public Roads, stated this most succinctly when he said:

"We were not a wealthy nation when we began improving our highways. But the roads themselves helped us create new wealth, in business and industry and land values. So it was not our wealth that made our highways possible. Rather, it was our highways that made our wealth possible."

Wealth and natural resources are in themselves without value. All the gold in all the world, all the petroleum reserves, all the manufactures, all the latent foodstuffs are useless until made available to mankind. They may lie buried under mountains or seas for millenia. They may rot wastefully miles from any market. They accrue no value until they move into the mainstream of commerce. Highways wed the consumer and the product. Highways create wealth.

This can nowhere be better demonstrated than by looking at my own State of Texas.

Texas has rich agricultural lands, abundant forests, more fresh water lakes and reservoirs than any other state ex-

cept Alaska, inland and coastal plains, mountains, seashores, prairies, vast areas of untillable "bad-lands" and a semi-tropical garden spot bordering the Rio Grande River which lies between the United States and Mexico.

In recent years Texas has become the greatest producer of petroleum products (about one-third entire United States production), has a burgeoning petro-chemical and manufacturing industry, ranks second among the states in value of farm and livestock production and has vast reserves of petroleum, gas and mineral deposits.

Early Times in Texas

This may sound like an economic paradise. But the Texas I remember as a small boy might very well be described as among the last of the American frontiers. In 1910 the population of Texas was less than four million, fewer than 15 persons per square mile. Fifty years ago 75 per cent of the population was classified as rural.

In East Texas, where rainfall is abundant, the roads frequently were impassable in the spring. In West Texas the sheer magnitude of distance discouraged all but the most necessary travel.

Markets for livestock and farm products still were a laborious journey of days. And a trip to the "big city" was an expedition to be prepared for as carefully as for a modern safari into deepest Africa or the Upper Amazon.

The Texas Highway Department

Early good roads enthusiasts may very well be credited with creation of the Texas Highway Department in 1917. In any event, they provided a receptive background for participation in the first Federal highway program. Such participation was contingent upon the establishment of a State Highway Department.

Nearly 50 years later the basic structure of this organization as originally conceived by the Texas legislature virtually is unchanged. Policies of the Texas Highway Department are formulated by a three-man commission appointed by the governor to staggered six-year terms. The commission in turn appoints the state highway engineer, who is charged with administrative direction and engineering responsibilities in planning and construction of public roads and highways.

From these early beginnings arose the foundations upon which Texas has built a 66,000-mile highway system which laces the state like a spider's web. Initially, the Texas Highway Department had 10 employes; today there are more than 16,000 regular employes engaged in all phases of highway design, construction, maintenance and administration.

In its first fiscal year the Texas Highway Department supervised the expenditure of approximately $1.25 million dollars. In the fiscal year ending August 31, 1964, Department disbursements totaled more than $466 million. Of the latter amount, approximately $364 million was for construction and $66 million for maintenance.

The Texas Highway Department spends approximately 78 per cent of its disbursable funds (five-year average, 1958-63) for construction, as compared to a national average among all states of 63 per cent. The national average cost for highway maintenance is approximately 25 per cent; in Texas it is 15 per cent.

Average administrative costs for the last decade have represented only about five-sixths of one per cent of total annual expenditures, well under the national average.

Pay As You Ride

Texas highways are constructed and maintained on a "pay as you ride" basis, and, for the most part, are paid for by highway users. Revenues are derived principally from the Federal Highway Fund, charges made for registration of motor vehicles, and a five-cents-a-gallon gasoline tax, lowest among all the states, of which 70 per cent is available for the highway system.

There are approximately six million registered vehicles in Texas today. They are driven about 50 billion vehicle miles a year. Texas adds about one-quarter million vehicles to its streets and highways each year, and the total number of miles driven is increasing at a rate of about five per cent a year.

More and better highways create a new demand. Not only are there more vehicles on the highways each year, but also each vehicle is driven more miles. As a result, we see little need for a boost in gasoline taxes within the immediate future. And this in spite of climbing costs for higher-design construction, maintenance, and the need for more miles of highways to accommodate the ever-increasing number of vehicles.

The Texas highway network may be said to be divided into three principal classifications, or systems:

The 3,025-mile Texas allotment of the Federal Interstate and Defense Highway System;

The 25,703-mile Primary System of State and U. S. numbered highways linking the state's principal cities and marketing centers; and,

The 37,111-mile Farm-to-Market system, with which I believe we should be most concerned as it relates so closely to the problems we will discuss during these sessions.

Farm-to-Market System

In 1949 the Texas Legislature took the first dramatic step that not only lifted the farmer out of the mud, but also opened the state to an almost unprecedented era of agricultural and industrial development. It was in that year that the first comprehensive Farm-to-Market road program received legislative authorization and financing. In the decade that followed, the Texas Highway Department expanded this Farm-to-Market road system by nearly 3,000 miles a year. At present, Texas is adding about 1,000 miles a year toward an ultimate goal of a 50,000-mile system.

In the 15 years since the Texas Farm-to-Market road program was initiated, the population of Texas has increased by more than 50 per cent. Texas has moved to second place among all the states in the value of its marketed products of farm and ranch. Its industrial development has been among the most rapid of any in the nation, or the world.

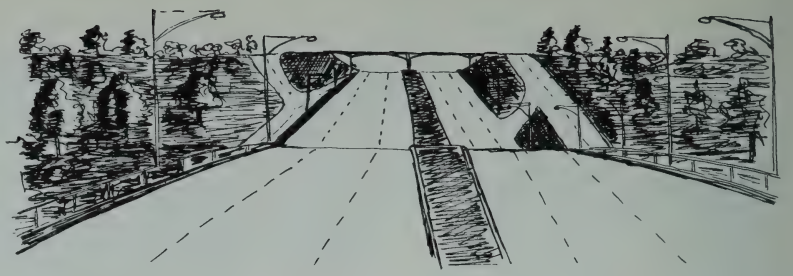
In the last two years more industries of all kinds have located new plants in Texas than in any of the other 49 United States. And many of these were induced to invest in Texas because of the excellent complex of Farm-to-Market roads in the rural areas, where there is an abundance of reliable labor and plenty of "growing room."

A Line of Communication

Through the years there has existed within the Texas Highway Department a consistent philosophy: That a good road is a line of communication between places, located over the most practicable route that will serve the most people, and constructed of a type and at a cost that will insure the taxpayers the maximum return on their investment.

At times we have had to revise our design standards to meet the ever-increasing demands upon our highways—heavier and faster vehicles, higher speeds, incorporation of added safety features. But we have seen no reason to change the basic philosophy.

In Texas, as everywhere in the world, road builders are looking for a low cost road. The reason is obvious. All road builders want to make happy as many



people as they can with a fixed number of dollars.

The basic question is whether or not there truly is a dependable "low cost" road. Many times that answer to this question rests in the maximum utilization of local materials and in adequate maintenance.

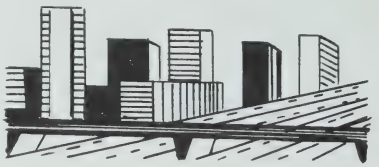
A Firm Foundation

Frequently it is feasible, as we found in Texas, to develop the geometrics of a road in such a manner that these particular features will endure for many years. The structural development of the road on these long-range geometrics could be light and rather cheap. A road of this type, which might last 10 to 15 years, can be reconstructed later to higher design standards.

Our experience has shown that where original circumstances permitted good alignment and adequate right of way, construction evolution has been possible at minimum cost and with the least disturbance to adjacent residents or newly-developed commercial or industrial properties.

Maximum use of local materials—locally available stone, gravel, shell, or other aggregates—is one essential to low cost road construction. In any event, the constituent parts of any low cost road must be capable of load-bearing whether dry or wet.

With the rise of the professional engineer there has followed that essential being known as the "maintenance foreman." It is the maintenance foreman who coddles the road designed by the engineer



and built by the contractor. It is he who knows its weaknesses, and who must assuage them as soon as they become apparent. And it is he who continuously must groom the cross section to avoid excessive wear.

The need to find the money to build the road is important. Good design and competent construction methods also are essential. But I cannot overemphasize the necessity for maintenance. A low cost road, well-maintained, can generate many times its cost in the new wealth it creates.

Trade Routes Across the Americas

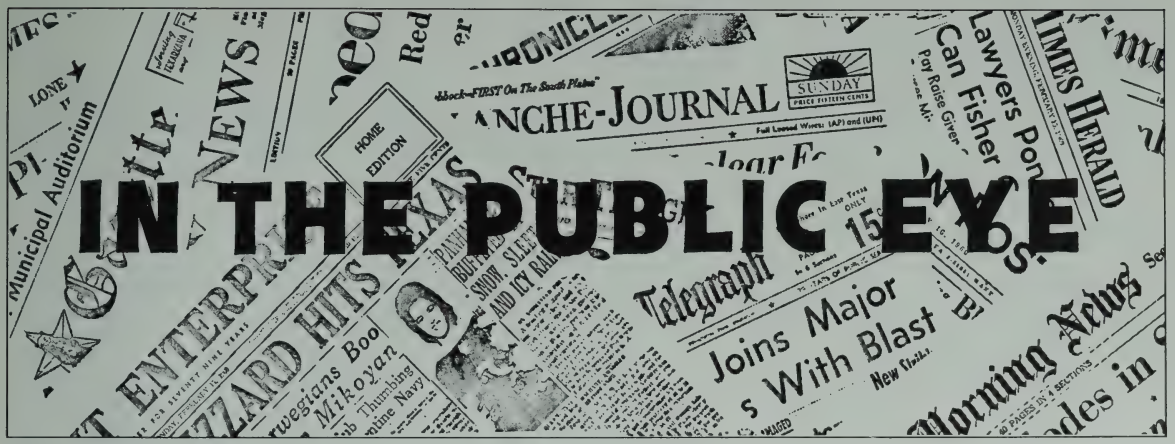
Opportunities of the growing nations of South and Central America—and indeed, around the world—are unmatched today. We are opening great new avenues of transportation, commerce and international understanding.

In the next few years the great Pan American Highway—first conceived some 85 years ago—will become a trade route to match the ages-old caravan trails extending from Spain, spanning the European and Asian continents, into mystic China. Only the mode—and the speed—of transportation will be different.

The peoples of all the Americas will seek an exchange of trade and a better understanding of their divergent cultures. It is for this that we are meeting here today.

Soon I will have completed 25 years as State Highway Engineer of Texas, and 40 years as an employe of that organization. They have been good and rewarding years. I have seen my state and my nation literally lifted from the mud. I have seen new and better highways bring wealth and prosperity to all of Texas.

And I hope that all of you who are here today—who have set your sights on that goal for your own nations—may see your dreams come true. ■



For Highways

Lubbock Avalanche-Journal comments—"Another warning against diversion of highway tax revenue to non-highway use has been sounded by Herbert C. Petry Jr., chairman of the Texas Highway Commission. . . . The main reason that Texas has, as Petry stated, been able to develop one of the nation's outstanding highway systems is because it has been largely successful in preventing diversion of highway tax funds. Every Texan ought to be proud of his highway system and thus insist that its financing not be diluted."

Roads to Pleasure

Lufkin News editorializes—"The Texas Highway Department already is recognized around the nation as having built one of the finest highway systems in the nation.

"Few states have roads better than those to be found in Texas; none has as many miles of improved roads. Texas also has been a leader in development of roadside parks, and in beautifying highway right of way.

"Now the Highway Department is planning to make East Texas a recreation and tourist mecca for people from throughout the nation, by an extensive program of new highways to provide access to all areas of Sam Rayburn, Dam B and Toledo Bend Lakes.

"Lufkin will benefit greatly from the new network of roads with two new access highways from this city to Sam Rayburn Lake. Other areas around Sam Rayburn Lake also will greatly benefit.

"With good highways leading to all sections of the Rayburn Lake, new roads to Dam B and new access roads to all portions of the Texas side of Toledo Bend Lake, tens of thousands of tourists and vacationing people will be encouraged to visit the lakes."

Home Builders Are Interested

Galveston Tribune reports—"The home builders are turning their attention to the county's needs in the matter of highways.

"Whether the County Homebuilders Association will renew a push for a mid-county highway connecting the Texas City area with the Manned Spacecraft Center is not known, but it is certain that the county will benefit from interest shown by such an organization.

"With the homebuilders and other groups pushing for continued attention, it appears certain the county's needs will continue to get full consideration."

Less Litter Means More Miles

Memphis Democrat, for clean highways—"If there's one thing near and dear to a Texan's heart, it's the State's superb 66,000-mile highway system. We Texans think, and rightly so, that our state has fine highways, and we are constantly thinking up additional routes to tie our communities together with hard-surface roads.

"Here in our area, several new highways are under construction which will be of vital benefit to our citizens. A new highway between Hedley and McLean will make a much shorter route for our citizens. Also, the Quail road is under construction which will make it much easier to travel to the north.

"But the Quail road will have to wait until the state has sufficient funds before the hard-surfacing contract is let, and this is a shame. The new bridge and base for the road is complete, but sufficient funds are not available for the hard-surface. Governor John Connally had this to say about the situation:

" 'Texas motorists paid for many miles of new highways last year. But they never were built.' The reason, Governor Connally pointed out, the state spent $1.5 million of taxes levied on highway users to pick up litter thrown along the right of way by careless motorists!"

Let's Hear it for Highways!

Being an account of how the people of a small Texas town brought back the "good old days" of highway enthusiasm

Keith Elliott
Travel and Information Division

"TEXANS used to be excited about the highway movement. They rallied in the streets and howled for better roads. And now that they've got them, they just take them for granted."

This lament was sounded not long ago by an oldtimer of the Texas good roads movement. Not without cause. It is a fact of life and a tattered cliche that times of drought engender more regard for water than do seasons of plenty.

You never miss the water till the well goes dry, as they say, nor indeed do you give much thought to it one way or the other.

Likewise highways.

But the cockles of the aforementioned oldtimer's heart would have warmed with pleasure had he chosen to be in Carrizo Springs on the first of May. For the entire community opted to celebrate highways, as in the good old days.

Verily, it was the good old days compounded. Consider:

- A special edition of the local newspaper, *The Javelin*, was devoted almost exclusively to stories and pictures of Texas highways, the Highway Department, the Highway Commission.
- At its annual banquet, a record-breaking sellout populated by more than 250 persons, the chamber of commerce saluted highways with a fervor that might have been embarrassing had it not been so sincere.

The meeting hall was decorated to establish a highway theme. Packets of highway literature were given to each guest. The evening's addresses were about

Flagmen Three: Texas Highway Commission poses before rolling exhibit of highway signs at Carrizo Springs highway headquarters dedication. The signs snipped a ribbon to open the facility.

Highway Commission Chairman Herbert C. Petry Jr. greets guests at dedication of Carrizo Springs highway engineering-maintenance complex.

highways and highway people and how important these factors are to a small town's economy and general welfare. Guests of honor were local highway employes.

• More than 200 people had turned out that afternoon for the dedication of a new maintenance warehouse and resident engineer's headquarters. Local officials apologized for the paucity of the turnout, explaining that a funeral had cut anticipated attendance by more than half. Worth of the physical plant being dedicated was something like $100,000. (Compare citizens' attitude with that in a major Texas city which recently dedicated a multi-million-dollar freeway before a gathering of just 20 persons.)

Flattered by such rare attention, the Texas Highway Commission made history of its own in Carrizo Springs on May Day. Follow the dots:

• It met formally for the first time in its 48-year history in a maintenance warehouse.

• It officially opened the facility by clipping a ribbon with a highway sign. Not so much a sign, really, as a consensus —or a confusion—of signs, mounted on wheels. Said one Commissioner of the unusual display, "Think of the havoc we could create if we wheeled this thing up to an interchange!"

• At that meeting it approved the largest single contract in the memory of the Texas Highway Department, a $9.7 million one for a massive new interchange (I.H. 10—I.H. 37) in San Antonio.

Hal Woodward, member of the Texas Highway Commission, was keynote speaker at the May 1 dedication ceremonies. More than 200 persons attended.

Withal, it was a big day in Carrizo Springs.

And let no cynic suggest that this was simply because Herbert C. Petry Jr., chairman of the Texas Highway Commission, happens to live there. His presence may have been a catalyst to the occasion, admits George Willems, president of the local chamber of commerce, "but the expression was strictly spontaneous on the part of the business community, once it occurred to us how important highways are to our town."

He adds: "And I imagine there are a hundred other towns in Texas with just as much reason to pay tribute to their highways. Highways are a small town's life's blood—their link with the major markets, and with the culture of their neighbors."

He and other speakers of the day pointed out other concrete benefits of the Texas highway program to local well-being. For instance, Commissioner Hal Woodward cited the 17 engineering personnel working under Resident Engineer Fred Clark as "an elite, professional

Warehouse meeting: Highway Commission met May 1 for the first time in a maintenance warehouse. By coincidence, they signed the largest contract in Highway Department history at the meeting. Discussing the contract (left to right) are J. C. Dingwall, assistant state highway engineer, Commission Chairman Herbert C. Petry Jr., and Commission members Hal Woodward and J. H. Kultgen.

Front step caucus at the home of Herbert C. Petry, Chairman of the Texas Highway Commission. Informal talk before formal events of a hectic day saluting Texas highways was shared by (left to right) J. C. Dingwall, assistant state highway engineer; Bob Townsley, head of Motor Vehicle Division; David C. Howard, State Representative from Uvalde; and Highway Commissioners Kultgen, Petry, and Woodward.

New Resident Engineer's Office at Carrizo Springs is headquarters for engineering and construction in Dimmit, Zavala and part of Maverick Counties.

The "new look" in maintenance warehouses. It serves Dimmit County.

Resident Engineer's Office is backdrop for officials attending May Day highway celebration. Left to right: Commissioners Hal Woodward and Herbert C. Petry Jr., District Engineer Chester Parsons, Resident Engineer Fred Clark, and Commissioner J. H. Kultgen.

Travis Brown (left), Maintenance Operations building section, and Jack Buttler, Carrizo Springs utilities chief, talk informally at luncheon for district and county highway personnel at Carrizo Springs restaurant. Buttler is father of Larry Buttler of Highway Design Division, Austin. Brown's section guides updating of facilities over the state in line with the Department's growing (now $72 million a year) maintenance mission.

cadre of which any city could be proud."

Their monthly payroll of nearly $8,000 helps keep the Carrizo Springs economy stable, Mr. Woodward declared, and the current construction program overseen by Clark and his men "adds additional value to the economy." Contract cost for the current construction in the three-county area under Fred Clark's supervision: $720,000.

Moreover, said Commissioner J. H. Kultgen, the Dimmit County maintenance program under George Brooke pumps another $120,000 a year into local circulation. He said:

"And this is typical of scores of such programs throughout Texas. The Highway Department spent $72 million on maintenance and betterment programs last year, and every dime of this amount was spent in Texas. The entire state benefits from the circulation of our construction and maintenance funds. Not only do these funds keep our highways smooth, they play a vital role in keeping our economy level, too."

But the grass roots contributions of highway people to the towns of Texas is more than a dollar-and-cents matter, Mr. Kultgen said.

"These people's thoughts and deeds relate a lot more to Carrizo Springs than they do to Austin. Highway Department employes are hometown folks, and the Highway Commission is proud of this fact. We're always happy when our people take an active part in the life of their community beyond their roles as highway professionals. It is immensely gratifying to see the towns and cities of Texas looking to the local offices of the Highway Department for leadership."

The audience that heard Mr. Kultgen translate Commission philosophy in terms of its local impact was the largest ever to gather at Carrizo Springs for a chamber of commerce banquet. Its reception of his remarks was enthusiastic.

Sufficiently so that, had our aforementioned oldtimer been present, he doubtless would have been gratified beyond the singing of it.

For the citizens of Carrizo Springs had proved that some Texans, anyway, can still get excited about highways. ■

Hot debate: Resident Engineer Fred Clark ponders a jalapeño. Behind him in the chamber of commerce buffet line are George Brooke, county maintenance foreman, and Mrs. Brooke.

AWARDS

40 Years

Bridge Division
Clyde F. Silvus, Bridge Engineer

Maintenance Operations Division
John A. Waller, Chief Engineer of Maintenance Operations

District 10
Benjamin F. Spinks, Skilled Laborer

District 15
Fred Lee, Skilled Laborer

35 Years

District 11
Paul Bates, Field Survey Worker III
John M. Nagle, Engineering Aide IV

30 Years

Secondary Roads Division
Reginald J. Lafrentz, Secondary Roads Designing Engineer

District 2
Jimmie N. Maloney, Shop Foreman IV

District 7
Scottie A. Houston, Maintenance Construction Foreman III

District 13
John F. Bennett, Semi-Skilled Laborer

District 15
Charles L. Korbell, Maintenance Construction Supervisor II

District 16
Herbert W. Hass, District Designing Engineer

District 18
Robert E. Dixon, Clerical Supervisor IV

District 22
John T. Templeton, Skilled Laborer

District 24
Martin V. Barrera, Semi-Skilled Laborer

25 Years

District 1
Jack D. Johnson, Inspector III

District 2
Raymond W. Barnes, Right of Way Agent IV
Wyatt A. Burks Jr., Engineering Assistant II

District 3
Wilburn H. Farquhar, Semi-Skilled Laborer
Charles A. Goforth, Skilled Laborer

District 10
Guy W. Teasdale, Field Survey Worker III

District 11
Johnnie L. Barge, Skilled Laborer

District 12
Madison D. Harrell, Materials Analyst III
Ernest V. Richardson, Skilled Laborer

District 14
Aubrey M. Kimbro, Skilled Laborer

District 17
Joseph G. Hanover, Assistant District Engineer

RETIREMENTS

Materials and Tests Division
Earnest F. Allen, Materials Analyst II

District 1
Joe B. Chitwood, Semi-Skilled Laborer
William M. Heath, Maintenance Construction Superintendent

District 2
Finnies N. Wigington, Skilled Laborer

District 4
Elbie C. Carr, Skilled Laborer
James D. Reese, Field Survey Worker III

District 7
Jose A. Rallose, Semi-Skilled Laborer
Frank Sessom, Skilled Laborer

District 9
Richard D. Forrest, Stock Clerk III
Lonnie W. Wiese, Skilled Laborer

District 11
Douglas M. Cook, Semi-Skilled Laborer

District 13
Alfred E. Brunner, Skilled Laborer
Edgar R. Johnson, Skilled Laborer
Anton A. Kutchka, Skilled Laborer

District 16
Ernell V. Rhea, Skilled Laborer

District 18
Ertie C. Allen, Skilled Laborer

District 19
Richard L. Calloway, Maintenance Construction Foreman III
Tilford G. Hughes, Draftsman III

District 20
Albert W. Hindt, Skilled Laborer
James Leatherwood, Skilled Laborer
Joe H. Perkins, Skilled Laborer
Jesse K. Wigley, Skilled Laborer

District 23
Porter McCarroll, Maintenance Construction Foreman III
Clarence G. Uffelman, Skilled Laborer

Management Team Studies THD

Ernst & Ernst, a management and accounting firm in San Antonio, began a financial management research study of the Texas Highway Department on April 13.

"The firm will study Department management in general," Wayne Courter, chairman and project director for the research program, explained when the study was announced. "There will be special emphasis on the financial and accounting areas. We hope to obtain better utilization of our data processing equipment and electronic computers as a result of this study."

The only other study made along these lines was conducted in the early 1930's, upon which the present Department financial structure is built.

Courter said the project was approved by the Bureau of Public Roads for participation under the Highway Planning Research fund program. Actually, the Bureau has recommended that states adopt a concurrent auditing and current billing system that will allow the Bureau to check the accounting system easily and accurately, and to assure that billing for reimbursements is up to date. Research by the accounting firm should provide the necessary answers for setting up such a system. Courter said about half the states have adopted concurrent auditing and current billing systems.

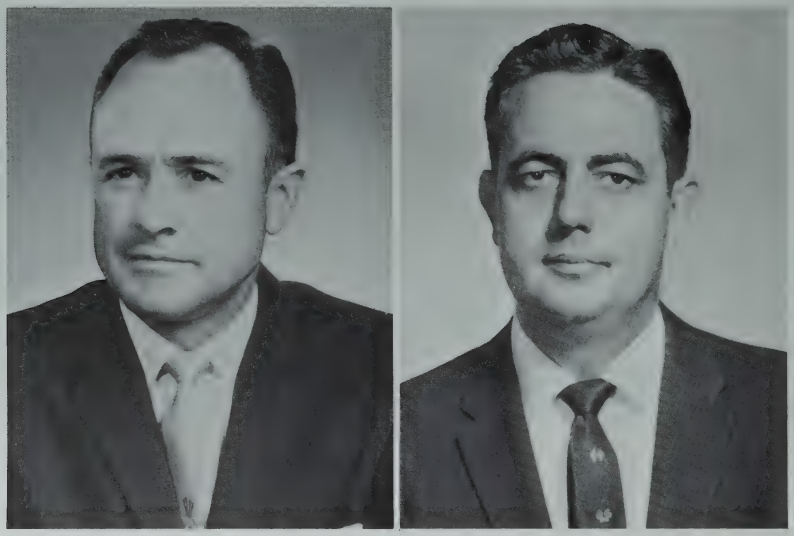
There are four key men from Ernst & Ernst making the research study. They include Walter F. Beran, Peter B. Shannon, Charles D. Slinkard, and Ish G. Callaway. They will work closely with a Department steering committee of five men: Courter, Ralph Kirkley, Aid Division; George Brooks, Accounting Division; Bill Sanders, Maintenance Operations Division; and Ted Ball, Operations Division.

continued on page 22

Wayne Courter (center), chairman and project director for the THD management study, discusses steps to be taken with Ish G. Callaway (left) and Peter B. Shannon, both from Ernst & Ernst, a management and accounting firm in San Antonio.

Five-man steering committee of the Highway Department aids in management research study. From left to right, they are Ralph G. Kirkley, Aid Division; Ted F. Ball, Operations Division; Wayne Courter, Special Assignments; George Brooks, Accounting Division; and Bill Sanders, Maintenance Operations Division.

Let's get down to business. The steering committee and representatives from Ernst & Ernst decide which field offices of the Highway Department will come under financial-management study. From left, they are Ish Callaway, Ernst & Ernst; Ralph Kirkley, Ted Ball, Wayne Courter, George Brooks, and Bill Sanders, all THD; and Peter Shannon, Ernst & Ernst.



Walter Beran (left), partner in charge, and Charles Slinkard represent Ernst & Ernst.

Scope of the research project is comprehensive. The contract with the firm calls for major emphasis on organization, procedures, methods and equipment pertaining to fiscal control, accounting and electronic data processing. The contract lists these fields of study to be covered:

1. Organizational structure, operating relationships, delegation of authority and channels of communication.
2. Basic internal operating policies.
3. Manpower utilization, manpower requirements and manpower controls.
4. Data processing equipment utilization, needs and potential.
5. Financial management practices including effective control of costs of operations, designations of responsibility for definite areas of accountability, and centralized control of income and expenditures records.
6. Operating procedures.

Ernst & Ernst will submit a final report to the Department recommending the best system or systems for the Department. The plan will also list ways for installing and converting to new procedures, timing of the changeover, and the manpower needed for such changes.

The research team conducted a preliminary two-week study of over-all operations of the headquarters office, including Camp Hubbard, and of District 14 offices in Austin.

On Monday, May 3, the consultant presented a tentative time schedule for detailed review of all operating functions and procedures of the Department in the headquarters, Camp Hubbard, and District 14 offices. Also, the consultant and the steering committee tentatively chose the field offices they will study: Houston Urban Project; District 12, Houston; District 18, Dallas; District 15, San Antonio; District 8, Abilene; and District 25, Childress. In June the management firm representatives will make thorough studies of these districts.

While conducting studies of the District offices, the team will continue to meet in Austin with the Department steering committee on the first Monday of each month and at any other time that a meeting is needed.

The contract calls for completion of the entire study in one year, but Beran believes it can be finished by the end of 1965. ■

Early Tuesday morning, May 11, an immovable object moved. Two 65-foot prestressed concrete beam spans, each weighing about 182 tons, fell on the freeway lanes of I.H. 45 when a tractor-trailer hit the supporting center pier.

Freak Accident Downs Overpass

Photographs by Marvin Bradshaw, District 18.

Buried under the 182-ton span is the cab of the tractor-trailer that hit the center pier, knocking out the two 30-inch diameter concrete column supports.

AT ABOUT ONE A. M. on Tuesday, May 11, a northbound tractor-trailer with a load of reinforcing steel hit the center pier of the Pleasant Run Road grade separation structure over I.H. 45 in Dallas County, District 18.

The collision knocked out the two 30-inch diameter concrete column supports, dropping the median ends of the two 65-foot prestressed concrete beam spans down to block the freeway lanes.

The tractor-trailer, owned by Tompkin Supply Company of Oklahoma City, Oklahoma, was buried under one of the fallen spans and the driver was killed.

Immediately after the accident, Pleasant Run was closed on each side of the structure and I.H. 45 traffic was routed onto the service roads to bypass the blocked freeway lanes. The prestressed beams were cracked and damaged in the fall, and the only salvageable portion of the two spans was the railing.

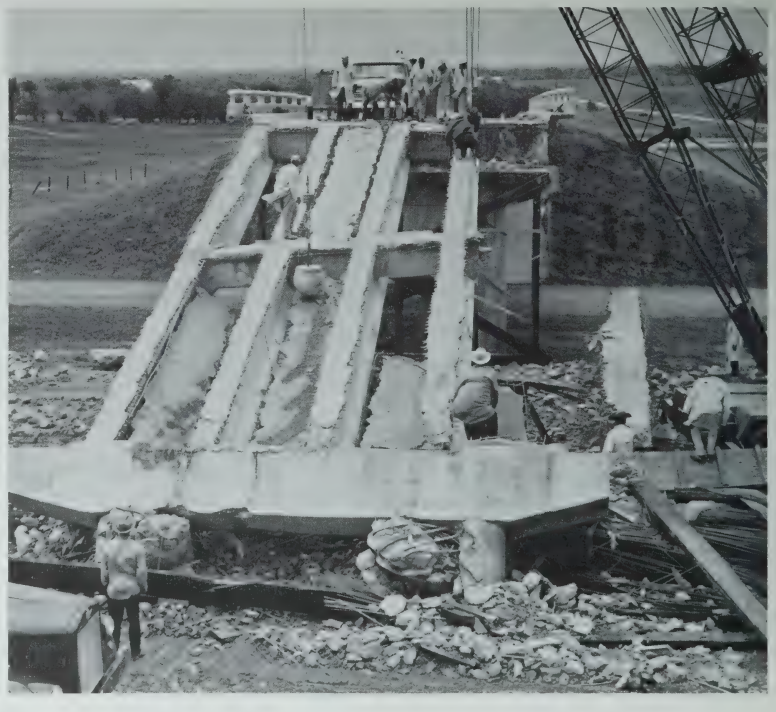
The first consideration of District 18 highway men was how to get the fallen spans off the freeway lanes as quickly as possible without causing further damage to the remaining bridge spans and bents. Removal of the spans presented quite a problem—each of them weighed approximately 182 tons.

The cargo that didn't make it. A load of reinforcing steel spills out of the tractor-trailer to add to the debris.

A Hydra-hammer is used to break up concrete between beams on the fallen structure.

Several contractors offered their equipment for use in removal of the damaged portion of the structure, and it was decided to take quotations for removal of the two damaged spans from over the freeway and hauling of the debris to the nearest interchange area (about one mile), where the material could be broken up and disposed of. In the meantime, Highway Department employes constructed temporary timber supports under each end of the two fallen spans.

Cecil Ruby Co., Inc., started span removal work on Thursday morning, two days after the accident, using two Hydra-hammers to break off the concrete curb overhang and to break out the slab between the prestressed beams. After removal of the overhang and slab, the horizontal steel was cut, two cranes were hooked onto the beam, the diaphragms



Cecil Ruby Co. employe uses cutting torch to sever reinforcing steel.

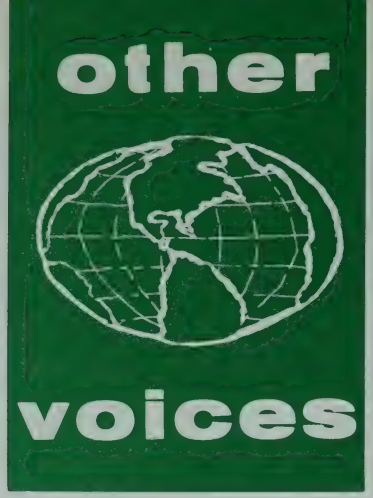
Two cranes lower concrete beam to the highway where a drop hammer crushes the beam to facilitate removal.

between the beams were removed, and the beams were lifted one at a time and placed on the ground. There the beams were broken up with a drop hammer, loaded into dump trucks, hauled to the interchange area and unloaded. The contractor's crew worked in a very efficient manner, completing their work in less than three days.

At 3:30 p.m. on Saturday, May 15, five days after the accident, I.H. 45 traffic was again routed over the freeway lanes.

Plans are being prepared and bids will be taken on replacing the center bent and two center spans of Pleasant Run Road over I.H. 45. ■

Only five days after the accident, I.H. 45 traffic is again using the freeway lanes. The contractor had cleared the roadway in less than three days.



Service Complexes More Complex

The shape of the motel industry is changing, according to Sylvia Porter, nationally syndicated financial columnist. And the change is being brought about by the Interstate highway system. Motel chains, oil companies, and restaurants are affiliating to set up service complexes. Cooperation extends to honoring credit cards and making travel reservations. The companies are convinced that the motorist will most likely stop at facilities that provide all the basic services at one stop.

Color Helps

A mid-Michigan pilot project using color combinations to help direct motorists at freeway interchanges has been a success, the State Highway Department reports.

Interviews of drivers revealed a general public acceptance of the color system; 85 to 90 per cent of the drivers interviewed believed the system to be definitely beneficial. Only a small percentage of drivers reported any degree of difficulty. Voluntary letters received by the Highway Department also revealed public favor for the program.

Vehicle movement studies showed that the color system of distinguishing exit and entry ramps from through routes reduced confusion.

In the color coding system, blue is used for exit ramps, yellow for entrance ramps, and white for the through route color in both edge marking and reflectorized delineators posted alongside the roadway.

Other highlights of the project:

- The two interchanges involve left-hand exit routes which create abnormal difficulty for the driver, but this was reduced by the use of the colors.
- Erratic maneuvers reduced 48.2 per cent at Mt. Pleasant and 33.5 per cent at Clare.
- No "extreme" erratic maneuvers, such as vehicles stopping and backing up, were observed after the coloration was instituted.

Materials for the project were provided by the Minnesota Mining and Manufacturing Company. Similar tests have been conducted in Minnesota and Florida under U. S. Bureau of Public Roads supervision in an effort to develop a national program for interstate network markings.

In the Plumbing Business

The Bridge Division of the New Jersey State Highway Department is building a 4.29-mile long tunnel—but not for vehicles. This one is for water. It's a trunk storm drain for I.H. 280, an east-west freeway depressed through Newark, East Orange, and Orange, New Jersey. The tunnel has a circular cross section eight feet in diameter; its wall is one foot thick, of cast-in-place concrete.

Several features about this tunnel make it noteworthy, and not the least of these is its cost—more than $2 million per mile, twice the national average for the cost of a mile of completed Interstate highway.

For almost four miles of its length, the depth below existing ground level ranges from 35 to 73 feet, and averages about 60 feet. The main reason for the great depth of the tunnel is that I.H. 280 has to be depressed sufficiently to go under not only grade-level city streets but also several arterial highways that are themselves depressed. The six-lane Garden State Parkway, for instance, is roughly 18 feet below grade at the point where it will be crossed by I.H. 280, some 20 feet farther down.

Why did the state choose this expensive way to construct I.H. 280? The New Jersey Highway Department proposed an elevated road through the three cities involved, but construction of this route was blocked by the cities on the grounds that the elevated road would be unsightly, would endanger traffic on local city streets, and would result in millions of dollars in lost taxable property.

After the cities had successfully blocked construction for more than five years, the state agreed to the depressed road. Hence the need for the drainage tunnel.

California Doubles Budget

The California Highway Commission has more than doubled its highway landscaping budget for 1965-66, adding 22 new landscaping projects along various freeway routes.

An additional sum of $6,050,000 was added for maintenance of landscaping, functional planting, and roadside rest areas. Nearly $2,500,000 will be spent for landscaping in Los Angeles County alone.

The largest landscaping project is along the San Diego Freeway in Los Angeles County. The charge will be $1,160,000. For the Golden State Freeway the commissioners have budgeted $785,000, and for functional planting along U.S. 99 in Merced County, they have set aside $400,000.

Red Means Stop

In New York State, the Department of Public Works has installed red pavement in front of stop signs as advance warning on two state highways, and orange pavement to identify merging lanes.

Broad green lines channel traffic into left-turn lanes at some intersections on Sunset Boulevard in Beverly Hills, California.

Experts believe color relieves the monotony of blurred gray concrete that they believe leads to "highway hypnosis." Also, "glance" notification of exits and entrances is essential on high-speed highways. Color-coded exit and entrance ramps "get the message" to drivers faster than signs with words that must be read at high speeds.

The Straight and Narrow

The nation's smallest state highways may be those maintained on Tangier Island in Chesapeake Bay by the Virginia Highway Department.

Although there are no cars on the island (Population, 1,000), the Department has maintenance responsibilities for pedestrian thoroughfares there. The widest such travelway is eight feet across.

They are so narrow that there is a local ordinance forbidding the opening of gates onto the roads, since two open gates could completely block the miniature highway.

No Paint for Steel Bridges

The Michigan State Highway Department has completed a series of steel bridges for an expressway interchange in Detroit that incorporate unpainted Bethlehem Steel Corporation's Mayari R steel (A-242). According to the producer, it is the first use of this material unpainted in a major highway structure.

The steel will never require painting. As the surface of the steel weathers, a firmly bonded protective skin forms. The protective coating ages to a rich brown color and builds up to about five mils in thickness, about the same as a heavy coat of paint.

The steel has been used before in railroad cars, ships, and transmission towers, but always with at least one coat of paint. There also have been recent architectural applications of it unpainted.

Grade separation structure in Detroit incorporates A-242 steel.

The interchange incorporates about 3,500 tons of the corrosion-resistant steel in a four-lane elevated structure about 1,850 feet long, two service bridges and a ramp bridge. Bethlehem fabricated the plate girders for the elevated structure at its Chicago works and Douglas Steel Company of Lansing, Michigan, fabricated the adjacent rolled beam structures. Steel erection was by L. A. Davidson Company of Detroit, general contractor on the project.

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New Paint for Steel Bridges

The National Cooperative Highway Research Program has awarded a $25,000 one-year contract to the Steel Structures Painting Council, Pittsburgh, Pa., for a study of the best available materials and practices in protecting steel bridges, guard rails and other structures from corrosion and deterioration.

The Highway Research Board, which administers the program, says that highway departments spend nearly $2 billion a year to paint and otherwise coat exposed steel. But there is a wide variance in methods and materials used to keep metal surfaces in good condition. The board quotes one source as saying that more than half of the nation's 50 state highway departments have structural steel-coating specifications that can be made more timely and more adequate.

Some departments are turning to galvanizing; some are using a red-lead base coat; others a chromate paint; still others aluminum paint for both base coat and the top coat.

One of the most important goals of the new research project will be to determine which, among the new and old coatings, have given and will continue to give the best protection under the most commonly encountered environmental conditions. All highway departments will be interested in the results.

General Munson Retires from Reserve Post

Photograph by F. W. Brown

Major General George P. Munson Jr., at change of command ceremonies in Houston on April 25, passes the standard of the 75th Maneuver Area Command, U. S. Army Reserve, to Brigadier General Felix A. Davis.

MAJOR GENERAL George P. Munson Jr., Houston's highest ranking active Army Reserve officer, has retired as commanding general of the 75th Maneuver Area Command, U. S. Army Reserve, the largest Army Reserve unit in the Department of the Army.

A veteran of more than 37 years military service that includes the Normandy invasion and the French and German campaigns during World War II, General Munson is also a veteran employe of the Texas Highway Department. He has served with the Department since 1932. Enlisting as an instrument man at the Franklin County Residency office, General Munson is now District Construction Engineer for the Highway Department in Houston, a position he has held since 1955.

At a retirement and change-of-command ceremony held in Houston on April 25 to honor General Munson, he passed the unit standard to Brigadier General Felix A. Davis, formerly deputy commanding general of the 75th Maneuver Air Command.

One of the most expressive supporters of the Reserve program, Munson has commanded the 75th MAC since February 29, 1960.

Munson is the holder of the Bronze Star, European-African-Middle Eastern Campaign Medals with four service stars, and the French Croix de Guerre.

Munson began his military career as a second lieutenant of Infantry following his graduation from Texas A&M in 1928.

When called to active duty with the 433d Signal Maintenance Company in 1941, Munson was a Highway Department resident engineer in Mount Vernon. On that fateful day, December 7, 1941, he assumed command of the First Reporting Company, 557th Signal Aircraft Warning Battalion at Fort Lawton, Washington.

In 1942 Munson became executive officer of the 843rd Engineer Battalion. The following year he became operations officer of the 926th Engineer Aviation Battalion. Munson commanded that unit en route to Europe and in England, in the Normandy invasion, northern France, and Germany.

Munson returned to the United States in 1945, and in January 1946, he returned to the Highway Department as senior resident engineer in Richmond. His career in the Reserve was also advancing, and in 1946 he was promoted to colonel.

Photograph by F. W. Brown

Men of the 75th Maneuver Area Command, U. S. Army Reserve, stand for review for the last time before their retiring commanding officer, Major General George P. Munson Jr., District 12 construction engineer.

In 1952 Munson was recalled to active duty as commander of the 44th Engineer Aviation Group. He left his position as district maintenance engineer in District 12, Houston, to serve eight months at Fort Leonard Wood, Missouri. Then, as commanding officer of the 20th Engineer Brigade, he shipped with his unit to France.

In 1953 Munson returned to the United States and to the Highway Department as district maintenance engineer in Houston. His new Army assignment was the command of the 406th Engineer Brigade, U. S. Army Reserve. Munson was promoted to brigadier general in 1956, and he became chief umpire of the 75th MAC in 1959.

Since he assumed command of the 75th MAC in 1960, the unit has been given a mission virtually unprecedented in Army Reserve activity. The mission is to prepare as well as to conduct a corps-level exercise involving representatives of five Army divisions in the Fourth U. S. Army Area, and personnel from the 12th U. S. Air Force Headquarters at Waco.

General Munson has definite feelings about the nation's need for military readiness:

"As long as we remain resolute in our will to be free, and as long as we are willing to defend our freedom at all costs, no enemy will ever be able to defeat us," he has asserted.

"It behooves every individual to prepare himself to defend this nation to the ultimate. We have only two choices: Be ready to fight or be enslaved." ■

Photograph by Pfc. Theodosia Cox

At a party held on the occasion of his retirement from the Army, Major General George P. Munson Jr. (center) talks highways with two other District 12 Highway Department men under his command in the 75th MAC, Major Edward S. Haroldson Jr. (left), senior design engineer, and Major Foyest W. Brown, senior resident engineer.

To and From Our Readers

That's Our Boy

G. P. Brown, Supervising Resident Engineer at Del Rio, District 22, traveled over to Beaumont in April to deliver a paper at the spring meeting of the Texas Section of the American Society of Civil Engineers. His topic, of course, was the Devils River Bridge, and it was good for $50, as the best paper presented in the structural division.

A Cooperative Venture

Ray A. Lewis, Public Relations Representative for Texas District of the Portland Cement Association, traveled to Cincinnati in April to speak on "Cooperative Relationships" at the Fifth Public Understanding Workshop of the American Road Builders Association. Here are a few of his comments:

"With the mounting tax burden upon our citizenship . . . the people must know and understand the value of good roads. In order to secure the highway dollar against midnight raiding by hungry interests, an alert, informed and responsive public must be developed and maintained. The highway departments cannot do this job alone. Supporting industry therefore assumes an obligation which mandates a duty, a duty to join hands with each other and with the highway department in the common cause. Short term, selfish gains by allied groups must be subordinated to the broader objective of promoting the highway program first."

"The philosophy of the Texas State Highway Department accommodates the truth that an informed public is the strongest bulwark against the damaging erosion of apathy."

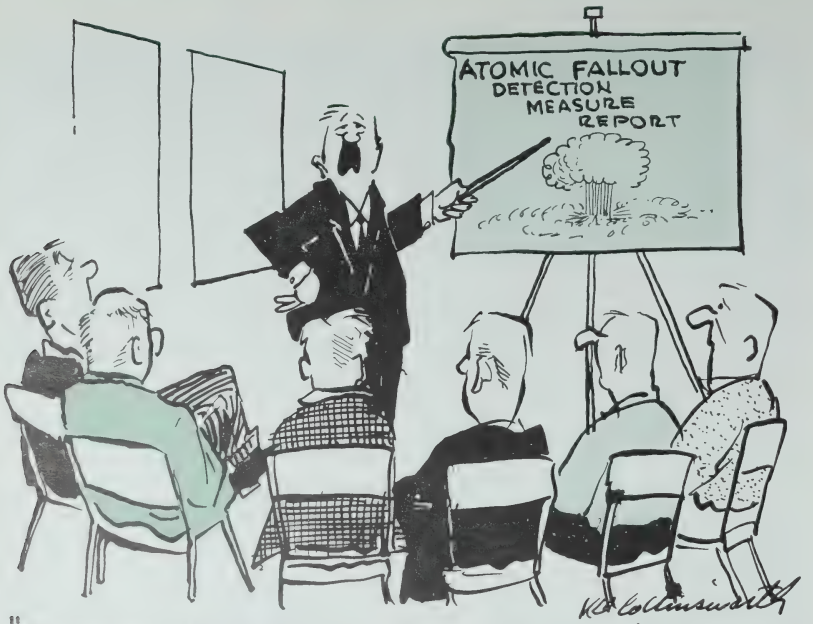
"The over-all objective of our entire coordinated effort is to render the driving public, the taxpayer, knowledgeable on the subject of good roads. If he is fully acquainted with the facts, we have implicit faith in his fair judgment."

Congratulations, Again!

Marjie Mugno, Travel and Information Division, is a two-time winner. She is editor of *Highway News,* a monthly publication for Highway Department employes in Austin. Last year *Highway News* won a Merit Award for outstanding journalistic efforts in a competition sponsored by the Southwest Conference of Industrial Editors.

She's done it again. *Highway News* has just been selected for the Award of Achievement by the International Council of Industrial Editors in their annual Evaluation and Awards Program. The competition included 614 entries.

Good girl, Marjie; we hate you!



"IN SHORT, IT IS IMPERATIVE THAT ALL AREAS ARE NOTIFIED IMMEDIATELY.... FOR INSTANCE WITH ABOUT THE SAME SPEED AS WHEN THE CHECKS COME IN!"

TEXAS HIGHWAY COMMISSION

HERBERT C. PETRY JR.	Chairman
HAL WOODWARD	Member
J. H. KULTGEN	Member
D. C. GREER	State Highway Engineer

Texas Highways

TEXAS HIGHWAYS, official journal of the Texas Highway Department, is published in the interest of highway development in Texas and for departmental education in the improvement of construction, maintenance, and operation.

TEXAS HIGHWAYS is available to the general public on a subscription basis at $3.50 annually, or it can be purchased for 35 cents a copy. Subscriptions, inquiries, material, or manuscripts should be directed to the Editorial Office, Travel and Information Division, Texas Highway Department, Austin 14, Texas.

Boss of the Year

Before April 21 of this year, it probably never occurred to Oscar L. Crain, District Engineer in Lubbock (District 5), to think of himself as a "ladies man." But on that fateful date, the ladies of Lubbock chose him above all others.

The ladies were all secretaries, members of the Caprock Chapter of the National Secretaries Association, and the occasion was their annual Boss Night Banquet. One of the high points of the banquet each year is the selection of the "Boss of the Year." And 1965 is Crain's year.

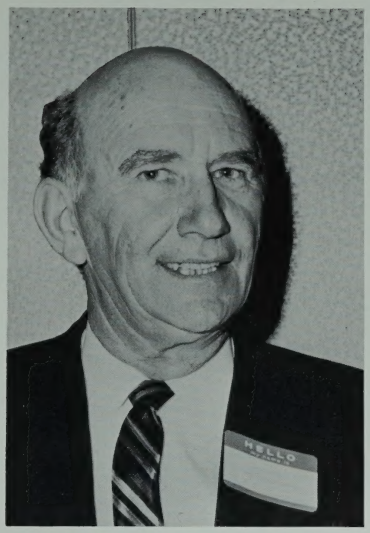
Crain's secretary, Ruby Jackson, is responsible for it all. In her letter to the selection committee nominating Crain, Mrs. Jackson wrote:

"Even though I was hired by someone else, and Mr. Crain just 'inherited' me when he came in 1958 to take the job with the Texas Highway Department in Lubbock, I feel that I could not have a better boss if I had chosen him myself. We have learned how to work together very well.

"I have a feeling of kinship to each of Mr. Crain's civic activities, and am proud each time he receives a new honor (and his honors are many)."

Crain is a member and past president of the Lubbock Rotary Club and is a steward in the First Methodist Church. He is past president of the Brazos Chapter of the Texas Society of Professional Engineers and has held several state-level offices in that organization. He was selected as "Engineer of the Year" in 1952 by the Brazos Chapter of the group.

He is past president and Life Member of the Brazos County A & M Club. A member of the Masonic Lodge, Crain is President of the South Plains Council of the Boy Scouts of America and a member of the organizing board of Lubbock Goodwill Industries.



Lubbock "Boss of the Year" Oscar L. Crain is better known in highway circles as District Engineer in District 5.

Ruby Jackson, Oscar Crain's secretary, comments, "I could not have a better boss if I had chosen him myself."

Photographs courtesy of the Lubbock Avalanche-Journal.

Beauty at the White House

"The beauty of our land is a natural resource. Its preservation is linked to the inner prosperity of the human spirit.

". . . . We must rescue our cities and countryside from blight with the same purpose and vigor with which, in other areas, we moved to save the forests and the soil."

President Johnson's admonition has special meaning for State Highway Engineer D. C. Greer and Landscape Architect Roy Rodman, since it appeared on an engraved invitation addressed to them for the White House Conference on Natural Beauty, May 24-25.

They were welcomed to the conference by Mrs. Lyndon B. Johnson and Laurance S. Rockefeller, and took part in panel discussions on such topics as "The Federal-State-Local Partnership," "Rehabilitation of Landscapes," "Scenic Roads and Parkways," "The Junk Problem," and "The Interstate Highway Problem."

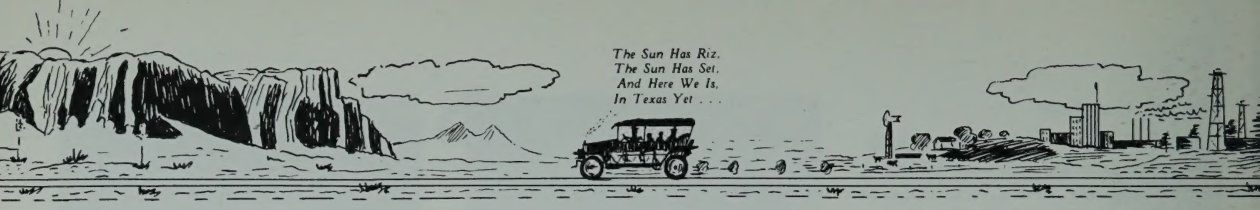
Secretary of Agriculture Orville Freeman presided at an open meeting of the Recreation Advisory Council, composed of the Secretaries of Defense, Interior, Agriculture, Commerce, and Health, Education and Welfare; and Administrator of the Housing and Home Finance Agency.

The Conference wasn't all work; the U. S. Air Force Band performed at the Lincoln Memorial on the evening of May 24, and the following afternoon after the final work session the conferees were honored at a White House reception.

Wait Till Next Year

Don't look for Lake Lyndon B. Johnson on the 1965 Official Highway Travel Map, or on any other current map of Texas.

On the maps the reservoir in Burnet and Llano Counties in Central Texas is called "Granite Shoals Lake," but the Lower Colorado River Authority changed it officially to "Lake Lyndon B. Johnson" last month.



OVER THE HIGHWAYS

Comments . . . from the Traveling Public

Mr. J. B. Bain
Texas Highway Department
Wharton, Texas
Dear Mr. Bain:

On Monday night, April 26, high winds blew several of our poles down on Highway 59 near Louise. We had a big job to get the highway cleared and electric service restored. Your men were a great help in controlling traffic while the work was underway.

I hope you will express to the men involved our sincere appreciation for their extra effort and cooperation during this emergency.

Aaron E. Autry, District Manager
Central Power and Light Company
Bay City

Mr. Tom Taylor, Director
Travel & Information
Texas Highway Department
Dear Tom:

Enclosed is a copy of a letter I received from Mr. Aaron E. Autry, District Manager of Central Power & Light Company, at Bay City, Texas, concerning assistance rendered by Highway Department personnel as a result of a storm which blew several of their poles and lines on the highway.

It was thoughtful of Mr. Autry to write as he did and I am sure Mr. Bain and Mr. Veazey will convey to the personnel involved our thanks and appreciation.

This is another splendid example of excellent public relations and of cooperation between private industry and Government in serving the public and restoring highways to use by the public as quickly as possible after a storm or other disaster.

It pleases me to receive a letter such as I received from Mr. Autry and commend all parties concerned.

H. C. Petry, Chairman
Texas Highway Commission

• Just a note to tell you how much I appreciate the help given me by two of your employees.

While returning from Dallas, my car had a flat tire and as I was sitting on the side of the road wondering "What now?" two gentlemen on their way to Austin to pick up two new trucks pulled over and before I knew it I was on my way again with the flat repaired.

Their help is greatly appreciated and I feel they are to be commended.

Jerri Frothingham
San Antonio

The Good Samaritans were Chappy D. Shelton and William G. Willman Jr., core drill operators in District 19.

• You have certainly done an outstanding job of planting bluebonnets around our state. Especially is this true near Lampasas, Burnet, Marble Falls, and they are gloriously beautiful around Lake Buchanan and Inks Lake.

Thank you.

Mrs. A. R. Walker
Azle

• We wish to say your Information stop near El Paso was most helpful in locating Harrison Street and our three day stay there was enjoyable. Your highways east are very good and we appreciated the lunch tables, etc. Was so surprised to see so many goats. Thought Texas was for cattle!

Enjoyed driving by the "LBJ" road. Would be nice if there was a roadside register to let the President know, when we citizens from some distance bother to go by for a "look see" and still respect their privacy.

Mrs. V. S. Conradsen
Bremerton, Washington

• Just to say thank you for the beautiful bluebonnets we saw recently in Van Zandt, Hunt, and Dallas Counties on the roadsides.

Matilda S. Wallis
Atlanta, Georgia

• Now that the Post Oak Freeway feeder streets are open for traffic through Bellaire, we would like to take this moment to thank you and your department for a job well done.

Traffic flows through Bellaire from many directions and with the construction of Freeway 610, much of the confusion will be eliminated. All the people of this community are proud of the rapid way you constructed the Freeway, and your thoughtfulness in building sidewalks is appreciated by the home owners.

Please let us know if we may ever be of service to you and your department.

Ward Onstad, President
Chamber of Commerce
Bellaire

Skilled laborer Charles Pace raises Old Glory and the standard of the Lone Star State at District 12 headquarters in Houston. Flag Day, June 14, is a good time to salute the flags that wave over all Texas Highway Department buildings.

An inviting roadside park area graces the relocated S.H. 63 east of Zavalla, seven short miles from the new Sam Rayburn Dam in East Texas.

Photograph by Jack Lewis.